UNITED STATES MARINE CORPS
Basic Officer Course
The Basic School
Marine Corps Combat Development Command
Quantico, Virginia 22134-5019

B0382

MECHANIZED OPERATIONS

Student Handout

1. **Historical Perspective**. "A mechanized operation is a tactical operation designed to maximize the ground mobility, protection, shock action, and firepower of the force through the use of combat vehicles to concentrate combat power rapidly against the enemy. Combat power is generated by the massed employment of tanks and by enhancing the mobility of other forces through the use of assault amphibian and other vehicles." (OH 6-1)

When mechanized operations are considered, it is not uncommon to picture German "Panzer" divisions rolling across the plains of Russia in massed tank formations, firing their main guns, and maneuvering against equally large formations of T-34s. While this was often the case, and the tanks were the principal weapon of the campaign, all other aspects of combat power played equally critical roles in the victories both sides realized during World War II. In fact in its truest sense, successful armor/mechanized operations relied on the total combined arms integration of a force's complete array of combat capabilities. In those instances where mechanized operations were not successful, it can often be traced to a disregard or a breakdown of the combined arms effort on the part of one or another of the forces engaged.

The close and effective coordination between infantry and armor was developed and later most effectively employed by the Germans in the years between the world wars. Although strategists like Fuller or Hart of Britain, or De Gaulle of France, theorized regarding the use of mechanized vehicles in future conflicts, it was primarily the Germans (Guderian and later Manstein) who successfully wed the "infiltration tactics" of the Western Front and the hardware innovations of the period (internal combustion engine, aircraft, mobile artillery, and wireless communication) that resulted in the kind of tactic known as "blitzkrieg."

These comments are not meant to suggest that Allied (primarily British and French) successes with tanks and infantry during World War I on the Western Front were totally insignificant. Their approach was one in which the tank was employed in a way that would support the infantry as a mobile bunker or "pill box." The pace of the attack remained that of a man on foot. The objective of the attack continued to be the mass penetration of the barbed wire protected trenches as it had been since 1914.

The distinct difference between the use of tanks and infantry by the Allies during World War I and in the opening stages of World War II and the newly formed German "Panzer" units was the relationship between the individual arms (armor, artillery, and infantry). As stated above, the Allies used tanks to support foot-borne infantry. Inherent to the new and revolutionary "Panzer" concept, the tanks now set the pace of the attack and were complemented by mobile, vehicle-borne infantry and fire support. By freeing the tanks and vehicle-borne infantry to move as fast and as far as logistics and mechanical engineering made possible, the overall tempo of the battlefield was dramatically increased.

This revolutionary means of making war put the Germans in the driver's seat and allowed them to dictate the terms of combat from 1939 until at least 1941. The United States and all European nations at that time continued to view the tank as an infantry support asset and were thus overwhelmed by the Germans' tactical innovations. Singly, tanks and infantry are powerful forces on any battlefield. Together, taking advantage of the speed and shock action provided by mechanization and the formidable characteristics of dismounted infantry, the Panzers initially proved unstoppable.

It should be noted that prior to actual "combat testing," the Panzer divisions were organized with a ratio of 16 tank companies to 10 infantry companies. It was almost immediately realized that this ratio was inadequate. It was therefore modified almost continuously during the war with the "normal" Panzer division eventually being composed of eight tank companies and 12 infantry companies. The structuring of the World War II German Army is generally considered the foundation for modern day mechanized forces. Therefore, with the trials of combat in both Europe and North Africa as the proving grounds (later confirmed by the Israelis in 1967 and 1973), it has become almost axiomatic that although the tank possesses tremendous firepower, shock effect, and a relatively high degree of mobility, it cannot survive on the battlefield without the close and continuous association with infantry forces.

2. **The Marine Corps and Mechanized Operations**. As in all cases the employment of combat power is situationally dependent. Mission, enemy, terrain, troops and fire support available, time (METT-T) all dictate how military forces are employed. The Marine Corps' combat experiences with armor have always seen this capability used in the infantry support role. For example, during World War II:

> Tanks fought at all times as infantry tanks and functioned as a major direct-fire close support weapon. At no time did Third Corps tanks operate beyond the observation and cover of infantry. In other words, "panzer" tactics so common in the European War were avoided by the Marines, and for good reason. The nature of the terrain and foliage and the antitank tactics employed by the enemy precluded panzer attacks. On the occasions when army tank units attempted to act independently of their supporting infantry, they met with disaster. (Isely and Crowl, pp 575-576)

Essentially the same comments can be applied to Marine experiences in both Korea and Vietnam. Although the Marine Corps has regularly used mechanized assets in combat and trains extensively with them today, it should not be considered a mechanized force capable of sustained offensive operations against an armor-heavy adversary. However, the principles for mechanized employment remain the same. Using assets from the tank, assault amphibian vehicle (AAV) battalions, and light-armored reconnaissance (LAR) battalions, the Marine Corps has the capability to "task organize" into a formidable Mechanized Combined Arms Task Force (MCATF). For example, during Desert Shield/Desert Storm, the Marine Corps task organized to form four regimental-sized MCATFs.

3. **Mechanized Assets in the Marine Corps**. The Marine Corps has three types of armored vehicles in its inventory: AAVs, M1A1s, and light armored vehicles (LAVs). Each vehicle has capabilities and limitations that dictate its employment within the MAGTF.

a. Assault Amphibian Vehicles. The AAV is the vehicle which separates the Marine Corps from other armed forces in the U.S. It is the only truly amphibious vehicle in the US inventory - it can launch from amphibious shipping well offshore, swim to the beach through heavy surf, and then assault inland. Through all these phases, the AAV can support itself from its up-gun turret which contains a MK-19 grenade launcher and an M-2 .50 cal machine gun, while at the same time providing light armor protection to 18 or more combat loaded Marines. The MAGTF uses AAVs, usually in conjunction with tanks, to act as armored personnel carriers for its infantry forces during every stage of the battle from the amphibious assault to exploitation far inland. For more specific technical information on the AAV, see Appendix A.

(1) There are two AAV battalions in the Marine Corps: one at Camp Pendleton and 29 Palms, and one at Camp Lejeune. There are also two platoons in Hawaii and a separate company on Okinawa. Each battalion contains four companies of three platoons each. A platoon has ten AAVs and can mechanize one reinforced infantry company. An AAV company mechanizes an infantry battalion, and an AAV battalion mechanizes an infantry regiment.

(2) The mission of the AAV battalion is to transport the surface assault element of the landing force from amphibious shipping to inland objectives in a single lift during the amphibious assault and to provide combat support for other operational requirements.

(3) There are three AAV variants: the AAVP7 troop carrier, the AAVC7 Command and Control variant, and the AAVR7 Recovery variant.

b. Main battle tanks. The Marine Corps' main battle tank is the M1A1. It is the most powerful and survivable tank in the world. Equipped with a stabilized 120mm main gun, thermal sights, and a gas turbine engine, it can make first round kills against enemy armor at 3000 meter ranges when traveling in excess of 30 mph, a capability that is not degraded by darkness or battlefield haze. As tanks cannot operate safely or effectively in the absence of infantry support, the MAGTF uses the tanks supported by infantry to punch holes in enemy defenses, allowing rapid penetrations deep behind enemy lines.

(1) There are two active duty tank battalions in the Marine Corps, 1st Tank Battalion at 29 Palms and 2nd Tank Battalion at Camp Lejeune. There are also two battalions in the reserves. Each battalion has four tank companies. These companies have 14 tanks (three platoons of four tanks each, and one tank each for the CO and XO) and one tank retriever.

(2) The mission of the tank battalion is to provide combat power to the Marine Division in the amphibious assault and subsequent operations ashore, using maneuver, armor protected firepower, and shock action to disrupt, disorganize, and destroy the enemy, his command, control, communication, and logistic capabilities.

c. Light armored vehicles. The LAV is the Marine Corps' armored reconnaissance asset. LAVs are organized into Light Armored Reconnaissance (LAR) Battalions and are used to gather information well forward of the main MAGTF units, providing the MAGTF commander operational flexibility by giving him stand-off distance. LAR is also used to protect flanks, perform screen missions and raids, and to conduct route and area reconnaissance.

(1) There are four LAR battalions in the Marine Corps, located in Camp Pendleton, Camp Lejeune, 29 Palms, and one in the reserve. Each battalion has four line companies, consisting of 14 LAV-25s, 4 LAV-ATs, 2 LAV-Ms, 1 LAV-R, 3 LAV-Ls, and 1 LAV-C2.

(2) The mission of the LAR battalion is to conduct reconnaissance, security, and economy of force operations and, within its capabilities, to conduct limited offensive or delaying operations that exploit the unit's mobility and firepower. The LAR battalion may function as an independent maneuver element, or its subordinate units may support other tactical units. LAR units may support the MAGTF or the GCE.

(3) There are six LAV variants: LAV-25, armed with a 25mm chaingun and carrying three crewmen and four scouts; LAV-AT, armed with a dual TOW missile launcher; LAV-M, armed with an 81mm mortar; LAV-C2, a command and control vehicle; LAV-R, a recovery variant; and LAV-L, the logistics vehicle. Currently an air defense vehicle, the LAV-AD, is under development.

4. **Characteristics of Mechanized Forces**. The Marine Corps is not a mechanized force, but, by task organizing, has the capability to mechanize portions of the GCE as dictated by the situation. You must have a sound understanding of the capabilities and limitations of mechanized forces to determine their proper employment.

a. Capabilities

(1) Armor-protected firepower. The armored vehicle is a powerful weapon that can defeat most targets on the battlefield. The armored vehicle gun is a high velocity, direct fire weapon that can be used against a variety of targets. The vehicle's armor provides protection against small arms fire, shell fragments, and some direct hits. The armor also allows the vehicle to close with the enemy and maneuver while under enemy fire or friendly supporting fires with relative immunity.

(2) Mobility. Mechanized forces can conduct ground combat operations over a broad area. They can operate dispersed and can also be rapidly concentrated at the decisive time and place. Mechanized forces can exploit their mobility by hitting the enemy in several places over a short period of time. Fully-tracked armored vehicles have a high degree of cross-country mobility.

(3) Shock. This is the effect of masses of large, powerful, and relatively invulnerable armored vehicles smashing through an enemy position or striking deep into his rear; it can have a devastating effect on enemy morale. This shock effect can be so tremendous that many theorists maintain that the ability of mechanized forces to destroy enemy morale is considerably more important than the actual physical destruction mechanized forces can cause. The more vehicles committed to the assault, the stronger the shock effect. Shock is best exploited using mechanized forces aggressively and en masse.

(4) Extensive communications. Armored vehicles carry extensive communications systems, with vehicle intercoms, powerful radios, and the capability to use ground wire. Armored vehicles normally can monitor at least two radio nets. Because of this, mechanized forces can operate over great distances, with sophisticated maneuver and fire support plans.

(5) Flexibility. Mechanized forces can respond rapidly to the ever-changing environment of the battlefield. Units engaged with the enemy can, with the proper use of supporting arms, disengage and be given new assignments. Mechanized forces can group, disperse, and regroup quickly to meet the needs of changing tactical situations.

b. Limitations

(1) Size. Armored vehicles are difficult to conceal. This can be overcome by hiding them from enemy observation until the mechanized forces are ready to be employed.

(2) Weight. Many bridges and roads, and some terrain will not support the weight of armored vehicles. The bridges and roads in the area of operations may have to be modified and strengthened. Also, special recovery vehicles are required to rescue armored vehicles should they become stuck. Careful selection of routes and areas of operation, as well as planning for necessary support, can minimize this limitation.

(3) Noise. Engine and track noise will warn the enemy of the presence of armored vehicles. Mechanized forces can still achieve surprise by moving forward just prior to commitment and by advancing rapidly under the cover of supporting arms.

(4) Visibility. When engaged and buttoned up, armored vehicle crews use periscopes and other protected vision devices. While the crew can look in all directions, the field of vision is very narrow, and the vehicle is extremely vulnerable to enemy action, especially to the flanks or rear. Mechanized forces are susceptible to ambush by tank-killer teams when operating in close terrain (urban areas, forests, jungles, or broken country). Infantry forces must accompany armored vehicles in close terrain to provide security.

(5) Logistics. Mechanized forces consume enormous quantities of fuel, lubricants, and ammunition. They also require considerable maintenance on a regular (at least daily) basis. Patton's Third Army ground to a halt in the fall of 1944 because they ran out of fuel while racing across France. Mechanized forces will quickly die if their logistics needs are not met.

(6) Existing obstacles. The most decisive limiting factor is terrain. In most situations, terrain dictates the number of vehicles which can be employed, but it will seldom prohibit their use entirely. The full striking power of armored vehicles is best achieved over rolling terrain which permits massing and exploitation of their cross-country mobility. Nevertheless, between the extremes of terrain--rolling terrain as opposed to impassable terrain--there is considerable ground that can be used.

Heavy rain, snow, fog, and extreme weather reduce the efficiency of vehicles and crews. The negative effects of terrain can be reduced by route reconnaissance, proper planning, and using engineering equipment to clear existing obstacles.

(7) Reinforcing obstacles. Minefields, tank ditches, tank traps, and roadblocks can restrict the movement of armored vehicles or canalize them into kill zones. Normally, many of these obstacles are temporary deterrents which can be overcome by proper employment of organic weapons, equipment, and personnel. More difficult obstacles can be reduced by engineers.

(8) Communications. Heavy reliance on radios for command and control makes mechanized forces vulnerable to enemy electronic warfare and/or signals intelligence efforts. Mechanized forces must practice radio discipline, use of SOPs, and alternate signals in order to operate in the face of enemy EW attacks.

5. **Mechanized Combined Arms Task Force**. To conduct missions (everything from MEU deployments and show of force operations to mid- and high-intensity conflicts) the Fleet Marine Force organizes Marine Air-Ground Task Forces. Many hot spots across the globe favor or demand the use of mechanized forces. The MAGTF commander will look to use mechanized units in situations as varied as mid-intensity conflict in the open desert (Desert Storm/Shield) to police actions in Panama City (Just Cause). This is done by forming a Mechanized Combined Arms Task Force (MCATF). The MCATF is task-organized for the mission; some situations may demand infantry or mechanized infantry supported by tanks (such as the breakout from the thickly vegetated bocage country in Normandy in August of 1944), others focus on tanks with infantry supporting (Desert Storm). The MCATF fights as a combined arms team, using armor, infantry, artillery, air, and service support together to create a combat punch specifically designed for the situation at hand.

a. Task organization. A MCATF is created around a nucleus of either tanks or infantry, or more rarely, LAR and its headquarters. For example, a MCATF could be formed around an infantry regiment and include a tank battalion, an artillery battalion, a combat engineer company, an LAR company, and combat service support attachments. The three types of task organization are described by the mix of infantry and armor within the MCATF.

(1) Tank heavy MCATF. Composed mainly of armor assets, with some infantry support. It is preferred when maximum shock action and firepower are required, terrain is open with few obstacles, and enemy antiarmor fire can be suppressed. It provides all the advantages of armor forces with the additional ability to take and hold ground. The US Army's VII Corps, the armored unit that conducted the "Hail Mary" move in February 1991, was made up predominantly of tank heavy forces and was able to bowl over the Iraqis.

(2) Mech heavy MCATF. Composed mainly of mechanized infantry (in AAVs) with some attached armor support and used when specific terrain must be controlled, in built-up areas or other close terrain, when visibility is limited, when enemy antiarmor fires are intact, or when obstacles are expected. The German Army fighting in the thick forests of northern Russia in WWII learned to use primarily mech heavy teams.

(3) Pure. Composed entirely of armor or mechanized infantry. This is unusual, but may be done for specific mission requirements. For instance, a counterattack force is often armor pure. Armor pure units may also be formed in high speed exploitation or pursuit missions when the AAVs won't be able to keep up with the M1A1s. Pure mech forces could be used in terrain that will not support tanks (marshy, soft areas).

b. The infantry battalion as a MCATF. An infantry battalion is normally formed into a MCATF through cross-attachment with a tank battalion. The tank battalion gives the infantry battalion a tank company and receives in return a mechanized infantry company. The infantry battalion further cross-attaches to form company teams by having the tank company give a tank platoon to a mechanized infantry company in exchange for a mechanized infantry platoon. Cross-attachment provides more flexibility to the MCATF and more options for the MCATF commander, in this case the infantry battalion commander. The final organization would look like this:

(1) Team tank. The tank heavy team; two platoons of tanks and one of mechanized infantry under the command of the tank company commander.

(2) Team mech. The mech heavy team; two platoons of mechanized infantry and one of tanks under the command of the infantry company commander.

(3) The third company could be either mech pure, if there are enough AAVs, or possibly heliborne or in trucks.

(4) Weapons company. The Dragon platoon would probably be attached out to the line companies, the 81mm mortar platoon would be "meched up" in its own AAVs, and the Heavy Guns platoon would be combined with TOW-mounted HMMWVs to form screening elements for the MCATF.

6. **Fighting with the MCATF**. "Its strength lies in the attack. It is especially suited for surprise appearances on the battlefield, rapid concentration of considerable fighting power, obtaining quick decisions by break-throughs, deep penetrations on

wide fronts, and the destruction of the enemy. The attack of the armored division has a serious effect on the enemy's morale" (The German Armored Division, 1940 training manual). Though the chances of the Marine Corps fielding an armored division are relatively rare, most Marine officers will have the opportunity to work in a battalion-sized MCATF which will fight as a series of company teams.

a. MCATF organization for movement. A battalion-sized MCATF generally has three maneuver elements (the company teams) and a screening element made up of the Heavy Gun Platoon, the Dragon Platoon, and a TOW section. These elements form a Combined Antiarmor Team (CAAT) and will lead the MCATF as a screening/scouting element. On contact, the CAAT teams will engage and destroy enemy armor and vehicles. If the MCATF decides to commit any of the company teams, then the CAAT teams will move off to the side and provide suppressive fire on the objective and flank protection for the MCATF. An LAR company may be attached to a battalion-sized MCATF and would be employed in a similar screening role.

b. Company team organization for movement. Both Team Mech and Team Tank can employ armor, mechanized infantry, or dismounted infantry to lead their formation.

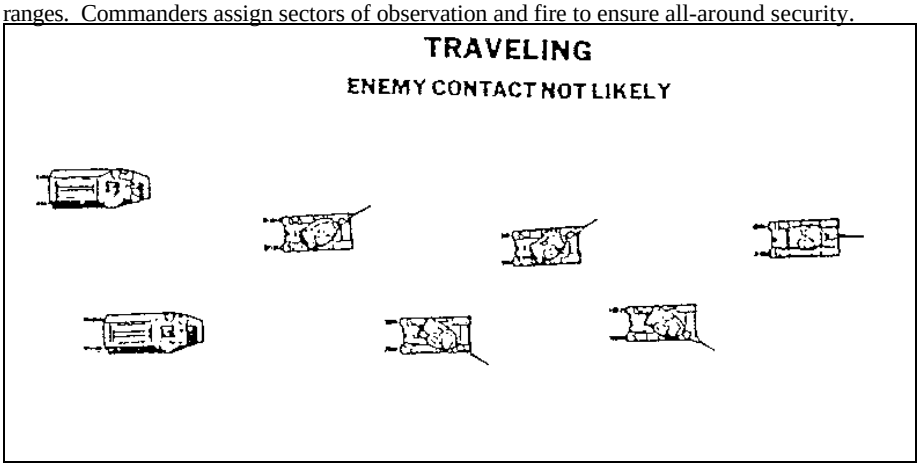
(1) Tanks lead. In most cases, tanks will lead the mech team because they can take punishment; they have the armor protection and the firepower to provide the best security for the lighter-skinned AAVs behind them. Tanks will certainly lead in open areas and when there is a significant enemy armor threat.

(2) Infantry leads mounted. Rarely employed. This may be done if the terrain does not support the movement of tanks (swampy ground) or if there is a significant enemy antiarmor threat and you fear an antiarmor ambush. In that situation, having the AAVs up front will allow the company team to dismount infantry quickly to clear out the enemy. AAVs are large, vulnerable targets that cannot take much punishment and generally should not lead formations.

(3) Infantry leads dismounted. If the terrain is very restricted (forests, broken terrain), visibility is poor, or if there is a significant antiarmor threat the company team will lead with dismounted infantry. Infantry may also lead dismounted when going through urban areas, obstacles, or fortified positions. However, Marines must realize that when leading with dismounted infantry we lose our mech advantages of shock and mobility.

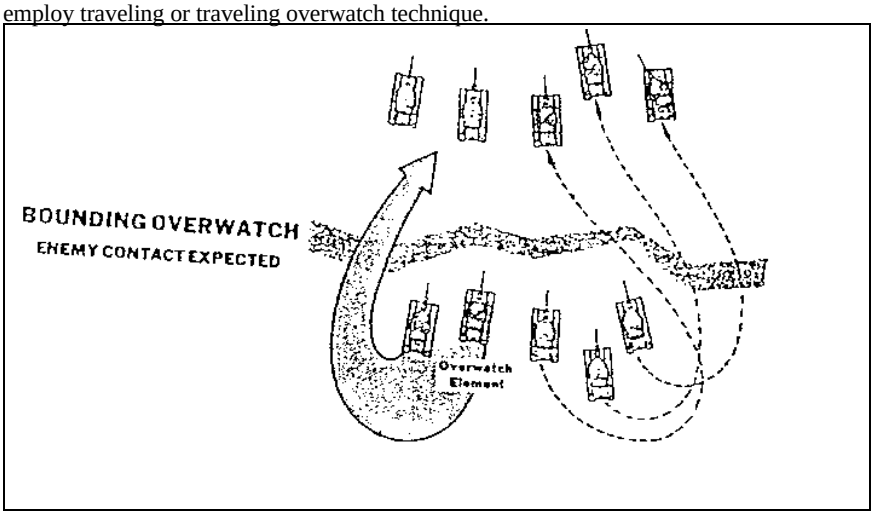
c. Techniques of movement. Similar to movement techniques for ground infantry forces. Consider the likelihood of enemy contact, speed, and terrain in choosing a movement technique.

(1) Traveling. The fastest and most easily controlled technique but also the least secure. All elements of the units move continuously and at a constant rate. Interval and dispersion are based on visibility, terrain, and vehicle weapons ranges. Commanders assign sectors of observation and fire to ensure all-around security.



(2) Traveling overwatch. More secure than traveling but slower and more difficult to control. The leading element moves continuously, as in traveling, while the overwatch element moves at variable speeds, sometimes pausing to overwatch from a stationary position when the situation permits. The overwatch element keys its movement to the terrain and to its ability to support the leading element by direct fire. Platoons may travel and overwatch by sections; companies by platoon. Normally, units moving in trace will employ the faster traveling technique.

(3) Bounding overwatch. The most secure technique but slowest and most difficult to control. Elements move by bounds with one element always in a stationary position to overwatch the movement of the other. Units may move by successive bounds, one element always leading and the other always overwatching and then bounding to join the leading element. Normally, companies bound by platoon, but platoons may bound by section. Other units in the rear of the formation generally employ traveling or traveling overwatch technique.



d. Company team in the attack

(1) Tanks and infantry attack together. This is the preferred method for it fully uses the shock, firepower, and armor protection of mech forces. The tanks will lead the AAVs in the attack. The infantry should remain mounted as long as possible, ideally dismounting on the objective or even continuing to roll on through the enemy position and allow follow-on units to mop up.

(2) Dismounting in the attack. If the mech force comes under effective antiarmor fires the vehicles will have to stop. The infantry will dismount to press the attack while the tanks and AAVs support by fire from covered positions until the objective is secured.

(3) Tanks support by fire. If the enemy has substantial antiarmor weapons or if the terrain is too rough for vehicles, then the tanks may be employed in a support by fire position. The tanks form a base of fire while the AAVs carry the infantry to a dismount point. This should be a covered and concealed position as close to the enemy as possible and should if possible allow the AAVs to use their weapons to support the attack. The infantry assaults the objective supported by the direct fire of tanks, AAVs, mortars, artillery, air, and/or naval gunfire.

7. **AAV Considerations**

a. Command relationship. The AAV platoon commander is not a maneuver element commander. He becomes an advisor to any commander to whom he is attached and is responsible to the commander for the maintenance and safe operation of his vehicles. He should be solicited for his opinions on AAV employment in the tactical situation.

(1) The rifle platoon's AAVs are directly under the tactical control of the rifle platoon commander. Each AAV is under the tactical control of the senior infantryman, or troop commander (TC), aboard.

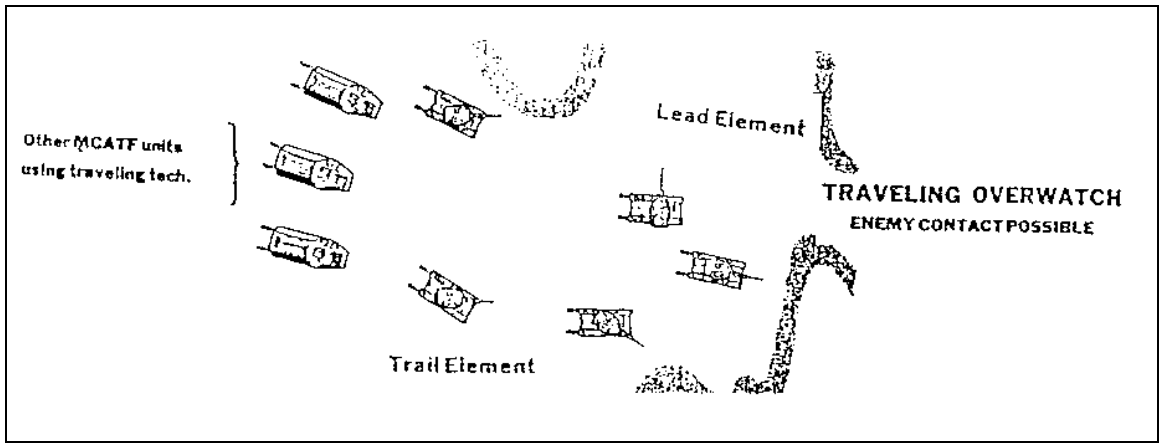
(2) The vehicle commander (senior AAV crewman) will advise the TC with regard to the safe operation and employment of the vehicle. He will also man the weapons station and is specifically responsible for control during waterborne operations.

b. Loading/unloading AAVs. One reinforced squad is assigned to each amtrack with crew-served weapons spread-loaded among all the company's vehicles. Similarly to boarding helicopters, we reverse load when boarding AAVs - those mounting first are the last to dismount tactically. Position a machine gun or SAW on the port side of the vehicle, behind the TCs hatch, to cover the deadspace of the AAV's turret. When dismounting, the driver should orient the bow of the AAV toward the enemy to present the smallest aspect and to provide more protection to the dismounting infantry.

c. Cargo hatches. The positioning of the hatches (open or closed) is driven by the commander's estimate of the situation. The hatches are very heavy, and the spring catch tends to give way, allowing the hatches to slam shut and injure Marines. If the hatches are left open they should be lashed down with ropes or straps.

(1) Hatches closed. Will provide protection against the weather and some limited protection against indirect fire (shrapnel). Must be closed during water ops.

(2) Hatches open. It is usually a good idea to have at least one hatch open. This allows the infantry to maintain their sense of direction and orientation to the battle around them. Additional air sentries and security can be posted. Infantry weapons can be employed from the top of the vehicle for more security.


Other MCATF units
using traveling tech.
Lead Element
TRAVELING OVERWATCH
ENEMY CONTACT POSSIBLE
Trail Element